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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,736	05/02/2006	Li-Qun Xu	36-1987	5174
23117	7590	12/09/2008	EXAMINER	
NIXON & VANDERHYE, PC			CONWAY, THOMAS A	
901 NORTH GLEBE ROAD, 11TH FLOOR			ART UNIT	PAPER NUMBER
ARLINGTON, VA 22203			4182	
MAIL DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/577,736	Applicant(s) XU ET AL.
	Examiner THOMAS A. CONWAY	Art Unit 4182

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(o).

Status

- 1) Responsive to communication(s) filed on 02 May 2006.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-6 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 5/2/2006 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1449)
 Paper No(s)/Mail Date 11/14/2006
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____
- 5) Notice of Informal Patent Application
- 6) Other: _____

DETAILED ACTION

It would be of great assistance to the Office if all incoming papers pertaining to a filed application carried the following items:

1. Application number (checked for accuracy, including series code and serial no.).
2. Group art unit number (copied from most recent Office communication).
3. Filing date.
4. Name of the examiner who prepared the most recent Office action.
5. Title of invention.
6. Confirmation number (See MPEP § 503).

Specification

1. The disclosure is objected to because of the following informalities: the instant application refers to the control program as "28" at page 8, line 33; and again at page 10, line 12 . According to Figure 1, the control program is labeled as "31".
2. The disclosure is objected to because of the following informalities: the instant application makes reference to "the mask image obtained from the segmentation step 2.3". There is no step 2.3 listed in any of the figures. It is assumed that the applicant is actually referring to step 2.10 which does "store a "mask" of segmented pixels".

Appropriate correction is required.

Claim Objections

3. Claim 1 is objected to because of the following informality: claim 1.b) recites "...shadow and/or highlights;". The use of "and/or" is considered to be indefinite.
4. Claim 4 is objected to because of the following informality: the instant claim recites "...at least on of a suite...". It is assumed that the word "on" is actually a misspelling of the word "one", and is being treated as such.
5. Claim 5 is objected to because of the following informality: claim 5.c) recites "...step a) would be or are segmented...". The use of "would be" is considered to be a negative limitation.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows (see also MPEP 2106):

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Nonfunctional descriptive material that does not constitute a statutory process, machine, manufacture or composition of matter and should be rejected under 35 U.S.C. Sec. 101. Certain types of descriptive material, such as music, literature, art, photographs and mere arrangements or compilations of facts or data, without any functional interrelationship is not a process, machine, manufacture or composition of matter. USPTO personnel should be prudent in applying the foregoing guidance. Nonfunctional descriptive material may be claimed in combination with other functional descriptive multi-media material on a computer-readable medium to provide the necessary functional and structural interrelationship to satisfy the requirements of 35 U.S.C. Sec. 101. The presence of the claimed nonfunctional descriptive material is not necessarily determinative of nonstatutory subject matter. For example, a computer that recognizes a particular grouping of musical notes read from memory and upon recognizing that particular sequence, causes another defined series of notes to be played, defines a functional interrelationship among that data and the computing processes performed when utilizing that data, and as such is statutory because it implements a statutory process.

7. **Claim 3** is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 3 recites "a computer program or a suite of computer programs which is considered nonfunctional descriptive material. Such nonfunctional descriptive material, in the absence of a functional interrelationship with a computer, does not constitute a statutory process, machine, manufacture or composition of matter and is thus non-statutory per se. Non-functional descriptive is non-statutory regardless of whether it is claimed as residing on a computer readable medium.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. **Claims 1 and 3-5** are rejected under 35 U.S.C. 102(b) as being anticipated by Porikli et al. (*Human Body Tracking by Adaptive Background Models and Mean-Shift Analysis*, IEEE International Workshop on Performance Evaluation of Tracking and Surveillance, March 2003 (PETS-ICVS 2003), pages 1-9), hereafter referred to as "Porikli".

Regarding claims 1 and 3-5, Porikli discloses an image processing method for detecting objects within an input image, the image being composed of picture elements, the method comprising the steps of: a) segmenting picture elements representing a foreground object within the input image from those picture elements forming the image background using a first segmentation technique, wherein the picture elements segmented as foreground include elements representing a shadow or highlight of the object (Section 3, paragraph 1); and b) segmenting picture elements which have the characteristics of a shadow or highlight of an object from those picture elements representing the foreground object using at least one other segmentation technique adapted to detect shadows and/or highlights (Section 3); the method being characterised by further comprising the steps of: c) segmenting as foreground surrounding picture elements to those picture elements which are already segmented as foreground (Section 4, lines 7-12); d) repeating (Section 4, lines 12-13) step c) until picture

elements which were not segmented as foreground after step a) would be or are segmented as foreground (Section 4, paragraphs 1-3); and then e) detecting as objects groups of adjacent picture elements which have been segmented as foreground (Section 4, paragraph 4).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. **Claims 2 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over "Porikli", in view of Sifakis et al. (Video Segmentation Using Fast Marching and Region Growing Algorithms, EURASIP Journal on Applied Signal Processing 2002:4, Hindawi Publishing Corporation, pages 379–388), hereafter referred to as "Sifakis".

Regarding claims 2 and 6, while Porikli does disclose all the limitations of claims 1 and 5, upon which claims 2 and 6 are dependent, Porikli fails to disclose the method of validating foreground pixel segmentation by comparison of the picture element with probability models relating to surrounding picture elements, wherein the

foreground segmentation is confirmed if at least half of the models indicate that the picture element is foreground.

Sifakis discloses a method of segmenting foreground and background pixels using a seeded region growing algorithm (Section 4.3) which basis its selection of region on probability models of neighboring pixels (S4.3.2, see also, Section 4, paragraph 2). As detailed by Sifakis, background and foreground segmentation takes into account inhomogeneity of regional characteristics, but at their local boundaries (at pixel neighborhood level) homogeneous similarities will allow for their discrimination (Section 4, paragraph 2). Regarding characteristics of neighboring pixels is a well known method of discriminating the probabilistic value of a pixel in question (determining which region it belongs to during segmentation).

While Sifakis doesn't specifically mention that the required validation limit needs to include confirmation from at least half of the models relating to the surrounding pixels to validate the pixel as foreground, the term half is a thresholding value and setting a threshold value is a well known heuristic method which results in a certain number of acceptable false positive foreground pixels.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to include in the method as outlined by Porikli, the capability to validate foreground pixel segmentation by comparison of the picture element with probability models relating to surrounding picture elements, wherein the foreground segmentation is confirmed if at least half of the models indicate

that the picture element is foreground, for the purpose of discriminating the foreground from the background.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yoshitaka et al. (Region-Growing Based Feature Extraction Algorithm for Tree-Like Objects, Visualization in Biomedical Computing, Springer Berlin/Heidelberg, Vol. 1131/1996, copyright 1996, pages 159-171) discloses background information regarding region growing and describes it to be used for segmentation, using a seed point and categorizes it as a morphological operation called 'closed-space dilation', in other words, a bounded dilation operation (Section 2, paragraph 2). Matsugu et al. (US 6,167,167) discloses an image extraction method which segments background and foreground, shadow removal and region growing based on characteristics of neighboring pixels.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS A. CONWAY whose telephone number is (571)270-5851. The examiner can normally be reached on Monday through Friday 8AM - 5PM EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benny Tieu can be reached on 571-272-7490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas A. Conway/
Examiner, Art Unit 4182

/Benny Q Tieu/
Supervisory Patent Examiner, Art Unit 4182